Amendments of the Claims

The following listing of claims will replace all prior versions and listings of claims in this application:

Listing of Claims

1. (original) A method of using a bottom hole assembly deployed in a borehole to estimate a formation property comprising the steps of:

(a) generating a source signal from said bottom hole assembly;

(b) detecting at least one receiver signal using said bottom hole assembly;

(c) computing a frequency dependent characteristic of said at least one receiver signal; and

(d) using said frequency dependent characteristic to estimate said formation property.

2. (previously presented) The method of claim 1 wherein said bottom hole assembly is a portion of a measurement while well logging system.

3. (currently amended) The method of ~~claim 2~~ claim 1 wherein said source signal is a noise spectrum generated by a drill bit of said drilling apparatus.

4. (previously presented) The method of claim 3 wherein said computing a frequency dependent characteristic is carried out by cross-correlation analysis.

5. (original) The method of claim 4 wherein said at least one receiver signal comprises a direct formation signal, and wherein said formation surrounds said borehole.

6. (original) The method of claim 4 wherein said at least one receiver signal comprises a reflected signal, and wherein said formation is ahead of said borehole.

7. (original) The method of claim 1 wherein said frequency dependent characteristic is amplitude attenuation.

8. (original) The method of claim 7 wherein the formation property is pore pressure.

9. (original) The method of claim 8 wherein said pore pressure is estimated from a frequency dependent attenuation relationship.

10. (original) The method of claim 1 wherein said frequency dependent characteristic is wave propagation velocity.

11. (original) The method of claim 10 wherein said formation property is pore pressure.

12. (original) The method of claim 1 wherein said formation property is lithology.

13. (original) The method of claim 1 wherein said formation property is fluid content.

14. (original) The method of claim 1 wherein said formation property is rock strength.

15. (previously presented) The method of claim 1 wherein said bottom hole assembly is a portion of a measurement while well logging system.

16. (original) The method of claim 1 wherein said source signal is generated by an active source located on said bottom hole assembly.

17. (previously presented) The method of claim 16 wherein said step of computing a frequency dependent characteristic is carried out by a frequency component analysis.

18. (original) The method of claim 1, wherein said at least one receiver signal comprises a direct borehole signal.

19. (original) The method of claim 18 wherein said formation property is permeability.

20. (currently amended) A method of continuously estimating the pore pressures of formations ahead of a bottom hole assembly, comprising the steps of:

a) generating a source signal from said bottom hole assembly wherein said source signal is a noise spectrum generated by a drill bit;

b) detecting at least one receiver signal using said bottom hole assembly;

c) using said source signal and said receiver signal to estimate a pore pressure of at least one said formation; and

d) repeating steps a), b), and c) as said bottom hole assembly moves sequentially downward through said formations.

21. (currently amended) A method of continuously monitoring the wellbore pressure safety margin corresponding to formations ahead of a bottom hole assembly, comprising the steps of:

a) generating a source signal from said bottom hole assembly wherein said source signal is a noise spectrum generated by a drill bit;

b) detecting at least one receiver signal using said bottom hole assembly;

c) using said source signal and said receiver signal to determine a pore pressure of said formation;

d) using said pore pressure to monitor said wellbore pressure safety margin; and

e) repeating steps a), b), c) and d) as said bottom hole assembly moves sequentially downward through said formations.

22. (currently amended) A method of continuously optimizing the weight of drilling mud used in a drilling operation, comprising the steps of:

a) generating a source signal from a bottom hole assembly wherein said source signal is a noise spectrum generated by a drill bit;

b) detecting at least one receiver signal using said bottom hole assembly;

c) using said source signal and said receiver signal to determine a pore pressure of a formation ahead of said bottom hole assembly; and

d) using said pore pressure to specify a weight of said drilling mud which corresponds to a target wellbore pressure safety margin.

23. (previously presented) The method of claim 1 wherein said using comprises estimating said formation property based on only one value of said characteristic, said value corresponding to a single frequency.

24. (previously presented) The method of claim 23 wherein said value in based on more than one evaluation of said characteristic at said frequency.